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IS 2620 (1963): Distilling flasks [CHD 10: Glassware]

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Indian Standard

SPECIFICATION FOR DISTILLING FLASKS

(Second Reprint DECEMBER 1982)

UDC 542.231.3 : 542.48

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *April* 1964

AMENDMENT NO. 2 JULY 2007
TO
IS 2620 : 1963 SPECIFICATION FOR DISTILLING FLASKS

(*Page* 6, *clause* **3.6**) — Substitute the following for the existing clause

"**3.6 Limit of Alkalinity —** When graded according to the method prescribed in 'IS 2303 (Part 1/Sec 1) : 1994 Grading glass for alkalinity : Part 1 Hydrolytic resistance, Section 1 Hydrolytic resistance of glass grains at 98°C Method of test and classification *(first revision)',* the distilling flasks shall conform to Class HGB 1 of the glass."

(Page 6, *clause* **4.1.1**) — Substitute the following for the existing clause:

'**4.1.1** *BIS Certification Mark*

Each flask may also be marked with the Standard Mark

4.1.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(CHD 10)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 1 JANUARY 2006
TO
IS 2620 : 1963 SPECIFICATION FOR DISTILLING FLASKS

(*Page* 5, *clause* **3.4**) — Substitute the following for the existing clause:

'**3.4 Nominal Capacity** — The distilling flasks shall be made in the following nominal capacities:

a) 30 ml, b) 50 ml, c) 100 ml, d) 125 ml, e) 150 ml, f) 250 ml,
g) 500 ml, h) 750 ml, j) 1 000 ml, and k) 2 000 ml.'

(*Page* 6, *Table* 1) — Substitute the following for the existing:

Table I Recommended Dimensions for Distilling Flasks

Sl No.	**Nominal Capacity**	**Internal Diameter of Neck**	**Length of Side Tube**	**Internal Diameter of Side Tube**	**Bulb Capacity**	**External Diameter of Bulb**	**Wall Thickness, *Min***
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ml	mm	mm	mm	ml	mm	mm
i)	30	16 ± 1	90 ± 3	4 ± 0.5	39 ± 2	43.5	0.8
ii)	50	16 ± 1	100 ± 3	4 ± 0.5	65 ± 3	52	0.8
iii)	100	16 ± 1	100 ± 3	4 ± 0.5	130 ± 5	65	1.0
iv)	125	16 ± 1	100 ± 3	7 ± 0.5	163 ± 5	68	1.0
v)	150	18 ± 1	120 ± 4	5.5 ± 0.5	195 ± 7	74	1.0
vi)	250	20 ± 1.2	140 ± 5	6 ± 0.5	325 ± 10	87.5	1.0
vii)	500	24 ± 1.5	160 ± 4	7.5 ± 0.7	650 ± 15	110	1.2
viii)	750	28 ± 1.5	160 ± 5	8.5 ± 0.8	975 ± 20	125.5	1.2
ix)	1 000	30 ± 1.5	160 ± 5	9.5 ± 0.8	1 300 ± 25	138	1.3
x)	2 000	33 ± 2.5	170 ± 5	10.5 ± 0.8	2 600 ± 50	170	1.5

(CHD 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR DISTILLING FLASKS

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Indian Standard

SPECIFICATION FOR DISTILLING FLASKS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 October 1963, after the draft finalized by the Laboratory Glassware and Related Apparatus Sectional Committee had been approved by the Chemical Division Council.

0.2 Taking into consideration the views of manufacturers, users and technologists, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the manufacturing practices prevailing in the country in this field. Furthermore, due consideration had to be given to the need for international co-ordination among recognized standards prevailing in different countries of the world. These considerations led the Sectional Committee to consult the following specifications:

IND/SL/5826-1955 FLASKS, BOROSILICATE, DISTILLATION. Ministry of Defence, Government of India.

B.S. 571 : 1953 FLASKS FOR THE DETERMINATION OF DISTILLATION RANGE. British Standards Institution.

0.3 Certain dimensions of the flasks have been fixed for compliance irrespective of their nominal capacities to ensure repeatability of results within reasonable accuracy. Relaxation in other physical requirements have, however, been made in order to meet the existing limitations of the industry in this country.

0.4 Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to the latest version of the standard.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960 Rules for Rounding Off Numerical Values (*Revised*). The number of significant places retained in the rounded off value shall be tame as that of the specified value in this standard.

0.6 This standard is intended chiefly to cover the technical provisions relating to distilling flasks, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard covers the requirements and the methods of test for a range of the distilling flasks suitable for standard tests for distillation range and for general use.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 1382-1961 Glossary of Terms Relating to Glass Industry, in addition to those given below, shall apply.

2.1 Bulb — The spherical part of the flask.

2.2 Bulb Capacity — The volume of water at 27°C, expressed in millilitres, contained by the flask at 27°C when filled to the base of the neck.

2.3 Neck — The tubular portion of the flask joined or made with the bulb at one end and finished with a rim at the open end which shall also be slightly broadened out.

2.4 Side-Tube — The glass tubing attached to the neck of the flask for connecting it to a condenser.

3. REQUIREMENTS

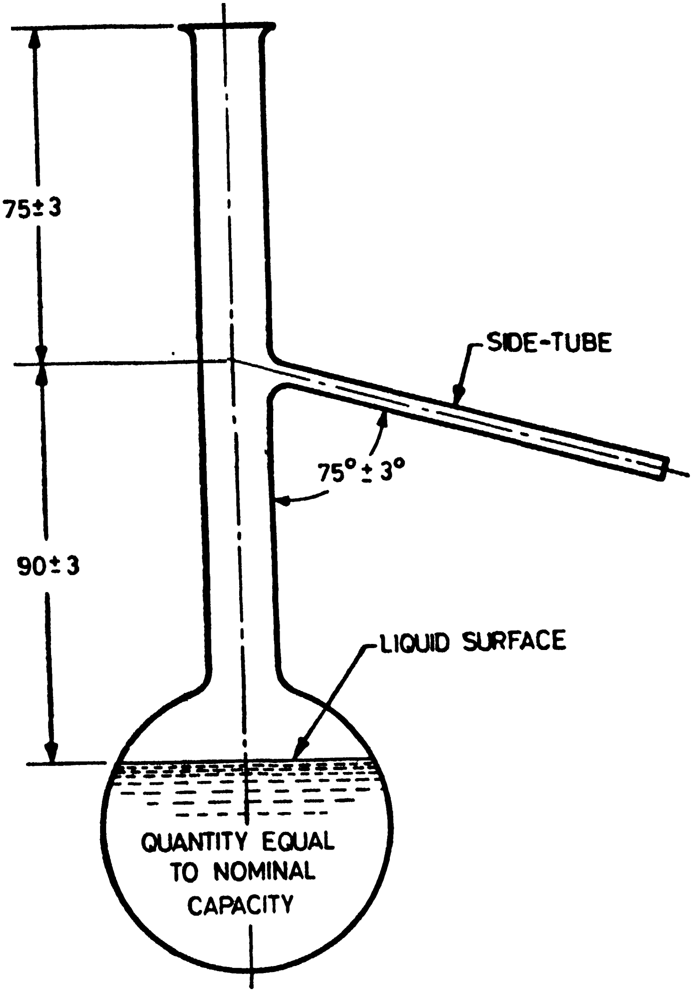
3.1 Pattern — The distilling flasks shall be of the shape illustrated in Fig. 1.

3.2 Material and Workmanship — The flasks shall be made of suitably annealed transparent glass not having any pronounced tint. They shall be appreciably free from stones, bubbles, striae, cords and other visible defects. Amber or other coloured glass may be used for special purposes.

3.3 Construction and Finish

3.3.1 The flasks shall be regular in shape and smoothly finished. They shall be symmetrical about the axes of their necks and the wall thickness shall be as uniform as possible.

3.3.2 The neck of the flask shall be smoothly joined or made with the bulb and its open end shall be fire polished at the rim which shall be smooth and in a plane perpendicular to the axis of the neck.



All dimensions in millimetres.

FIG. 1 DISTILLING FLASK

3.3.3 The side-tube shall be smoothly formed with the neck, and its open end shall be in a plane perpendicular to its axis.

3.4 Nominal Capacity — The distilling flasks shall be made in the following nominal capacities:

a) 30 ml,	d) 130 ml,	g) 500 ml,
b) 50 ml,	e) 150 ml,	h) 750 ml, and
c) 100 ml,	f) 250 ml,	j) 1 000 ml.

3.5 Dimensions — The recommended dimensions for the distilling flasks are given in Table I. The dimensions indicated in Fig. 1 shall be mandatory.

TABLE I RECOMMENDED DIMENSIONS FOR DISTILLING FLASKS

SL No.	NOMINAL CAPACITY	INTERNAL DIAMETER OF NECK	LENGTH OF SIDE TUBE	INTERNAL DIAMETER OF SIDE TUBE	BULB CAPACITY	EXTERNAL DIAMETER OF BULB	WALL THICKNESS, *Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ml	mm	mm	mm	ml	mm	mm
i)	30	16 ± 1	90 ± 3	4 ± 0.5	39 ± 2	43.5	0.8
ii)	50	16 ± 1	100 ± 3	4 ± 0.5	65 ± 3	52	0.8
iii)	100	16 ± 1	100 ± 3	4 ± 0.5	130 ± 5	65	1.0
iv)	130	18 ± 1	120 ± 4	5 ± 0.5	170 ± 6	71	1.0
v)	150	18 ± 1	120 ± 4	5.5 ± 0.5	195 ± 7	74	1.0
vi)	250	20 ± 1.2	140 ± 5	6 ± 0.5	325 ± 10	87.5	1.0
vii)	500	24 ± 1.5	160 ± 4	7.5 ± 0.7	650 ± 15	110	1.2
viii)	750	28 ± 1.5	160 ± 5	8.5 ± 0.8	975 ± 20	125.5	1.2
ix)	1 000	30 ± 1.5	160 ± 5	9.5 ± 0.8	1 300 ± 25	138	1.3

3.6 Limit of Alkalinity — When graded according to the method prescribed in IS : 2303-1963 Method of Grading Glass for Alkalinity, the distilling flasks shall conform to type 1 of the glass.

3.7 Thermal Shock Resistance — The distilling flasks shall pass the test prescribed in Appendix A.

4. MARKING AND PACKING

4.1 Marking — Each flask shall have permanently marked on it:

a) nominal capacity followed by the letters 'ml';
b) manufacturer's name and registered trade-mark, if any; and
c) a roughened surface not less than one square centimetre for marking purposes.

4.1.1 Each flask may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4.2 Packing — The distilling flasks shall be packed as agreed to between the purchaser and the supplier.

5. SAMPLING

5.1 Representative samples of the distilling flasks shall be drawn as prescribed in Appendix B.

5.2 Criteria for Conformity

5.2.1 Select two flasks from the 42 samples for alkalinity test (*see* **3.6**) and test them according to the method given in IS : 2303-1963 Method of Grading Glass for Alkalinity. If the flasks pass the test then only the remaining samples shall be tested for conformity of the lot to other requirements. If the flasks fail in this test, no further testing need be done and the lot shall be rejected.

5.2.2 Select from the remaining 40 flasks the number of flasks according to Table II and test them for thermal shock resistance *(see* **3.7**). Any sample not satisfying the requirement of the test shall be considered defective.

TABLE II NUMBER OF SAMPLES TO BE SELECTED FOR THERMAL SHOCK RESISTANCE

LOT SIZE	SAMPLE SIZE
10 or less	7
11 to 20	8
21 ,, 30	10
31 ,, 50	11
51 ,, 150	12
151 and above	13

5.2.2.1 If the number of defectives among the samples tested (*see* **5.2.2** and Table II) is one or nil, the lot shall be tested for other requirements (*see* **5.2.3**). If the number of defectives among the samples drawn and tested is two or more, the lot shall be rejected without further tests. Mix the flasks tested for thermal shock resistance with the remaining samples selected in accordance with **B-1.4.**

5.2.3 Test for other requirements shall be done in stages by taking 8 samples at each stage out of a total of 40 samples and a decision taken in accordance with the directions given under **5.2.3.1** to **5.2.3.5** read with Table III. When a decision is reached further samples shall not be tested.

TABLE III CRITERION OF JUDGEMENT AT DIFFERENT STAGES

(*Clause* 5.2.3)

STAGE	SAMPLE SIZE	COMBINED TEST SAMPLES		
		Size	Acceptance No.	Rejection No.
(1)	(2)	(3)	(4)	(5)
1st	8	8	No decision possible	2
2nd	8	16	0	4
3rd	8	24	1	4
4th	8	32	3	6
5th	8	40	6	7

5.2.3.1 The first stage of sampling shall constitute a selection of 8 samples at random from a total of 40 samples and testing them individually. If the number of defectives is found to be two or more (the corresponding rejection number shown in col 5 of Table III), the lot shall be rejected without further tests.

5.2.3.2 If the number of defective samples is less than two (*see* col 5 of Table III), proceed to the second stage and draw another 8 samples at random from the remaining 32 samples. Examine them and add the number of defective samples to those found in the first stage.

5.2.3.3 If the total number of defective samples is found to be equat to or less than the acceptance number (which is 0 at the 2nd stage), the lot shall be accepted without further testing.

5.2.3.4 If the total number of defective samples is found to be equal to or greater than the rejection number (which is 4 at this stage), the lot shall be rejected without further testing.

5.2.3.5 If the total number of defective samples is found to be between the acceptance and rejection numbers, proceed to the third stage and apply the same method, and so on till a decision is reached.

APPENDIX A

(*Clause* 3.7)

TEST FOR THERMAL SHOCK RESISTANCE

A-1. APPARATUS

A-1.1 Air-Oven — having a temperature range up to 250°C and provided with a thermostat and an air-stirrer or circulator to ensure temperature uniformity.

A-1.2 Water-Bath — fitted with stirrer and thermometer and maintained at 27 ± 1°C.

A-2. PROCEDURE

A-2.1 Heat the oven to a temperature of 152°C and maintain the temperature at 152 ± 1°C. Place the requisite number of distilling flasks in the oven separated from each other. Allow the samples to remain in the oven for a period of 30 minutes to attain uniform temperature. Remove the samples one by one by means of tongs with asbestos-covered tips and quickly immerse in the water-bath maintained at 27±1°C. The process of transfer shall be completed in 5 ± 1 seconds for each flask. The flasks shall remain immersed to half the height of the body in cold water for 2 minutes.

A-2.1.1 The distilling flasks shall be deemed to have complied with the requirement of this test if they suffer no damage in the test.

APPENDIX B

(*Clause* 5.1)

SAMPLING PROCEDURE FOR DISTILLING FLASKS

B-1. SCALE OF SAMPLING

B-1.1 Samples to determine the conformity of distilling flasks to the requirements of this specification should be selected in accordance with the procedure given in **B-1.2** to **B-1.4.1**. However, the purchaser and the supplier may agree to adopt any other procedure.

B-1.2 Lot — All the flasks in a single consignment having the same nominal capacity shall constitute a lot. Thus, if a consignment consists of 126 flasks of 100 ml, 250 flasks of 250 ml, 360 flasks of 500 ml, 75 flasks of 1 000 ml nominal capacities, the consignment shall be separated into four lots of 126, 250, 360 and 75 flasks, respectively.

B-1.3 Samples shall be tested from each lot for ascertaining conformity of the flasks in the lot to the requirements of this specification.

B-1.4 Test Samples — Forty-two samples shall be drawn from each lot. In case the lot size is less than 42, all items in the lot shall be drawn. Random number tables shall be used for drawing the samples. If such random number tables are not available, systematic samples shall be drawn in the manner presented in **B-1.4.1.**

B-1.4.1 If the lot size is N and 42 samples are to be drawn in accordance with **B-1.4,** obtain a number $R = N/42$. Arrange all the flasks of the lot serially. Select any number K at random between 1 and R. Draw Kth, ($K + R$)th, ($K + 2R$)th samples and so on up to 42 samples. In case R is a fractional number, the integral part shall be taken to be its value.

Example:

If the lot contains 350 flasks of one type, that is $N = 350$, then
$R = 350/42 = 8.33$
or $R = 8$ (omitting the fraction).

Select a number, say 4, between 1 and 8. The samples shall be as under:

1st sample = 4th flask of the lot
2nd sample = 4 + 8 = 12th flask of the lot
3rd sample = 4 + 8 × 2 = 20th flask of the lot
and so on till
42nd sample = 4 + 8 × 41 = 332nd flask of the lot.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Matt	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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Printed at Simco Printing Press, Delhi, India